Actuarially-Based Assessment

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Actuarially-Based Prediction

Statistical analyses that combine measures of offender characteristics to best predict future behavior.

Result of analyses is an actuarial assessment.

The Washington State DOC Static Risk Assessment is an example of an actuarial assessment.
Six Domains of Offender Characteristics
Washington State DOC Static Risk Assessment

A. Demographics: age and gender
B. Juvenile Felony Convictions & JRA Commitments
C. DOC Commitments
D. Felony Convictions (Sentencings)
E. Misdemeanor Convictions (Sentencings)
F. Sentence Violations
A. Demographics

1. Age at time of assessment
2. Gender
Each item has an value....

1. Age at Time of Current Sentence
   60 or Older (0)  20 to 29 (4)
   50 to 59 (1)    18 to 19 (5)
   40 to 49 (2)    13 to 17 (6)
   30 to 39 (3)

2. Gender
   Female (0)   Male (1)
Future Behavior Predicted By Static Risk Assessment

Outcome being predicted is 3-year recidivism: commission of crime resulting in conviction.

Types of Recidivism:
• Misdemeanor or Felony
• Felony
• Felony Drug
• Felony Property
• Violent Felony
Construction and Validation of Static Risk Assessment

**Construction:** Based on a statistical analysis of 308,423 felony offenders who were either released from prison or jail or placed on community supervision before 2001.

**Validation:** 51,648 felony offenders who were either released from prison or jail or placed on community supervision from 2001 to 2002.
The item values are weighted and summed via statistical analysis to produce three risk scores that “best predict future behavior”

Some examples:

<table>
<thead>
<tr>
<th>Item</th>
<th>Felony</th>
<th>Property</th>
<th>Violent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at Time of Current Sentence</td>
<td>+5</td>
<td>+4</td>
<td>+2</td>
</tr>
<tr>
<td>Gender</td>
<td>+5</td>
<td>+5</td>
<td>+4</td>
</tr>
<tr>
<td>Prior Juvenile Non-Sex Violent Felonies</td>
<td>+2</td>
<td>+2</td>
<td>+5</td>
</tr>
<tr>
<td>Felony Homicide</td>
<td>-5</td>
<td>-3</td>
<td>+1</td>
</tr>
<tr>
<td>Felony Domestic Violence</td>
<td>+3</td>
<td>+6</td>
<td>+10</td>
</tr>
<tr>
<td>Misdemeanor Domestic Violence</td>
<td>+2</td>
<td>+3</td>
<td>+3</td>
</tr>
<tr>
<td>Other Misdemeanor Domestic Violence</td>
<td>-3</td>
<td>-1</td>
<td>+1</td>
</tr>
</tbody>
</table>
Relationship between felony score and felony recidivism

- **Validation Sample**
- **Construction Sample**
- **Estimated Recidivism Rate**

3-Year Felony Recidivism Rate vs. Felony Score graph.
The three risk scores are combined to produce five risk levels, which are somewhat arbitrary.

1. Low Risk
2. Moderate Risk
3. High Felony Drug Risk
4. High Felony Property Risk
5. High Violent Felony Risk
3-Year Recidivism Rates for Each Risk Level Validation Sample N=51,648

- Misdemeanor and Felony
- Felony
- Felony Drug
- Felony Property
- Violent Felony

Low (32%)
Moderate (24%)
High Drug (9%)
High Property (19%)
High Violent (16%)
### Accuracy of Prediction Equations*

<table>
<thead>
<tr>
<th></th>
<th>Construction</th>
<th>Cross-Validation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>308,423</td>
<td>51,648</td>
</tr>
<tr>
<td>Any Felony</td>
<td>0.756</td>
<td>0.742</td>
</tr>
<tr>
<td>Property/Violent</td>
<td>0.757</td>
<td>0.733</td>
</tr>
<tr>
<td>Violent</td>
<td>0.745</td>
<td>0.732</td>
</tr>
</tbody>
</table>

*AUC varies from .500 to 1.00.

- 0.500s: No accuracy
- 0.600s: Weak
- 0.700s: Moderate
- 0.800s: Strong
- 0.900s: Incredible
- 1.000: Perfect
## Risk Level Percentage Distribution for Each Offense Group

**Sentenced to Prison: 2000 to 2005**

<table>
<thead>
<tr>
<th>Offense</th>
<th>Low</th>
<th>Moderate</th>
<th>High Drug</th>
<th>High Property</th>
<th>High Violent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>22%</td>
<td>11%</td>
<td>12%</td>
<td>27%</td>
<td>30%</td>
<td>100%</td>
</tr>
<tr>
<td>Drug</td>
<td>60%</td>
<td>7%</td>
<td>26%</td>
<td>4%</td>
<td>4%</td>
<td>100%</td>
</tr>
<tr>
<td>Property</td>
<td>8%</td>
<td>10%</td>
<td>11%</td>
<td>56%</td>
<td>15%</td>
<td>100%</td>
</tr>
<tr>
<td>Assault</td>
<td>12%</td>
<td>11%</td>
<td>8%</td>
<td>16%</td>
<td>54%</td>
<td>100%</td>
</tr>
<tr>
<td>Robbery/Kidnap</td>
<td>10%</td>
<td>16%</td>
<td>6%</td>
<td>22%</td>
<td>45%</td>
<td>100%</td>
</tr>
<tr>
<td>Sex</td>
<td>45%</td>
<td>14%</td>
<td>5%</td>
<td>12%</td>
<td>24%</td>
<td>100%</td>
</tr>
<tr>
<td>Homicide</td>
<td>57%</td>
<td>13%</td>
<td>5%</td>
<td>8%</td>
<td>18%</td>
<td>100%</td>
</tr>
</tbody>
</table>
How Well Does the Static Assessment Work for Sub-populations?

Works just as well for:

1. Females
2. Minorities
3. Dangerously Mentally Ill Offenders
4. Different types of offenders
5. Sex offenders, but predicts violent but not sexual re-offending.
6. District and municipal court criminal non-traffic cases, not DUIs.
B. Juvenile Record

3. Felony convictions

4. Non-sex violent felony convictions

5. Felony sex convictions

6. Commitments to state juvenile institution
C. Commitment to the Department of Corrections

7. Number of commitments to the DOC
D. Adult Felony Record

8. Homicide
9. Sex
10. Violent property
11. Assault offense—not domestic violence
12. Dom. viol. assault or protection order viol.
13. Weapon
14. Property
15. Drug
16. Escape
E. Adult Misdemeanor Record

17. Assault—not domestic violence
18. Dom. viol. assault or protection order viol.
19. Sex
20. Other domestic violence
21. Weapon
22. Property
23. Drug
24. Escapes
25. Alcohol
F. Adult Sentence Violations

26. Sentence/supervision violations